Express Mail No.: EL 451 597 169 US

FORM PTO-1390 (REV. 11-94)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)		10925-003-999 09/889029

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/00072	5 January 2000	8 January 1999

TITLE OF INVENTION
DEVICE FOR SEPARATING FLUIDS

JC14 Rec'd PCT/PTO 06 JUL 2001

APPLICANT(S) FOR DO/EO/US
Troubounis *et al.*

Applicant herewith submits to the United States Designated/ Elected Office (DO/EO/US) the following items under 35 U.S.C. 371:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted herewith (required only if not transmitted by the international Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)

6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureaus.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.

8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 37(c)(3)).

9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (executed).

10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.

14. ☐ A substitute specification.

15. ☐ A change of power of attorney and/or address letter.

16. ☒ Other items or information:

Unexecuted Declaration;
Written Opinion and translation;
Response to Written Opinion with amendments and translation;
International Search Report;
International Preliminary Examination Report; and
Return Post Card.

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE
PCT/DE00/00072 09/889029	5 January 2000

17. ☒ The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees as follows:

CLAIMS				
(1)FOR	(2)NUMBER FILED	(3)NUMBER EXTRA	(4)RATE	(5)CALCULATIONS
TOTAL CLAIMS	25 - 20	5	X $ 18.00	$ 90.00
INDEPENDENT CLAIMS	1 - 3	0	X $ 80.00	0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $ 270.00	☐

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): **CHECK ONE BOX ONLY** ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... $ 690	
☐ No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... $ 710	
☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO $1000	
☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2) to (4) ..... $ 100	
☒ Filing with EPO or JPO search report ..... $ 860	$ 860.00
Surcharge of $130.00 for furnishing the National fee or oath or declaration later than 20 30 mos. from the earliest claimed priority date (37 CFR 1.492(e)).	
TOTAL OF ABOVE CALCULATIONS	= 950.00
Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed also. (Note 37 CFR 1.9, 1.27, 1.28).	- $ 475.00
SUBTOTAL	= 475.00
Processing fee of $130.00 for furnishing the English Translation later than 20 30 mos. from the earliest claimed priority date (37 CFR 1.492(f)).	+
0 TOTAL FEES ENCLOSED	$ 475.00

a. ☐ A check in the amount of $__ to cover the above fees is enclosed.

b. ☒ Please charge Deposit Account No. 16-1150 in the amount of $ 475.00 to cover the above fees (order no. 10925-003-999). A copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 16-1150. A copy of this sheet is enclosed.

18. ☐ Other instructions

n/a

19. ☒ All correspondence for this application should be mailed to

PENNIE & EDMONDS LLP
3300 Hillview Avenue
Palo Alto, CA 94304

20. ☒ All telephone inquiries should be made to (650) 493-4935

Thomas D. Kohler	Thomas D. Kohler	32,797	July 6, 2000
NAME	SIGNATURE	REGISTRATION NUMBER	DATE

Fluid Separating Apparatus

The invention relates to a fluid separating apparatus for separating liquids and solids from a multicomponent fluid. Such apparatuses are used in water purification, pulp and sludge thickening as well as in de-ashing or fractionation, particularly in the paper industry.

Conventional fluid separating apparatuses operate according to different principles for separating the clear fluid from the various solids. The separation principle depends on the expected composition of the multicomponent fluid.

US 42 74 963 discloses a generic separating apparatus. This apparatus is typically used for suspensions of recovered waste paper, which contain paper fibers, light contaminants (plastics, wood) and heavy contaminants (e.g., glass, sand and metal particles). Due to the specific weight difference, the heavy contaminants could actually be easily separated from the water by means of this sedimentation apparatus. The separation, however, would work only if no light contaminants were present since the fibers and plastics persistently impede or interfere with the sedimentation process. The light contaminants further form a scum layer on the open surface inside the filter tank, which would impede or even clog the inflow into the machine.

On the other hand, the light contaminants could be readily separated from the water by a so-called disk thickener. In the presence of heavy contaminants, however, e.g., sand and glass, such a disk thickener is subject to very high wear. As a result a disproportionate amount of maintenance and repair would be required and the overall life of the entire apparatus—and thus its efficiency—would be clearly reduced. In other words, the separating process is inefficient

irrespective of whether an apparatus according to the generic publication is fluidically arranged in front of or behind a disk thickener.

Based thereon the object of the invention is to define a fluid separating apparatus in accordance with the preamble of claim 1, which operates without wear and effectively separates a multicomponent fluid into three different fractions, a clear liquid, a sludge fraction and a particle fraction. The aim is a high-quality separation of the multicomponent fluid into three different fractions, the clear liquid, a sludge fraction and a particle fraction.

According to the invention, this object is attained by the features set forth in claim 1. Advantageous further developments of the idea underlying the invention are set forth in the dependent claims.

Through the feature combination of claim 1, the light contaminants are continuously discharged via the rotary filter unit. This prevents the light particles from hindering sedimentation so that the heavy contaminants are reliably separated in the sedimentation space.

The invention—in contrast to prior art machines connected in series—achieves a substantially clearer separation of the two solids fractions into heavy particles (usually inorganic and suitable for disposal in landfills) and light particles (usually organic and either suitable for incineration or recyclable in the process). On the other hand the clear liquid has undergone a substantially greater degree of clarification. At the same time, the apparatus—compared to the aforementioned fictitious series connection of two individual apparatuses—is less prone to malfunctions and therefore economically more efficient.

An essential advantage of the arrangement according to the invention is that it makes it possible to separate a fluid/solid mixture into three different fractions in one compact structure. The apparatus according to the invention is configured in such a way that it rarely ever clogs or becomes inoperable. The arrangement permits a very high fluid throughput.

The invention and its embodiments will now be described in greater detail with the aid of the attached drawings in which:

Fig. 1 is a schematic longitudinal section through a first embodiment of a separating apparatus according to the invention,

Fig. 2 is a schematic top view of the separating apparatus shown in Fig. 1,

Fig. 3 is a schematic front view of the separating apparatus shown in Figures 1 and 2,

Fig. 4 is a schematic section through a rotary filter disk arrangement as an integral component of the separating apparatus,

Fig. 5 shows three schematic longitudinal sections through alternative embodiments of filter tanks with baffle arrangements,

Fig. 6 shows three schematic side views of a separating apparatus according to the invention with a gas injection device,

Fig. 7 is a schematic longitudinal section through a second embodiment of the invention,

Fig. 8a is a schematic cross section along line A–A of Fig. 7,

Fig. 8b a schematic cross section along line B–B of Fig. 7, and

Fig. 9 shows three schematic views or sections through a third embodiment of the invention.

The first embodiment of a fluid separating apparatus **10a** schematically depicted in three views in Figures 1 to 3 essentially comprises a long channel **12** inclined at

an angle to the horizontal, in the interior of which a conveyor screw or conveyor spiral **14** is arranged. The conveyor screw **14** is either supported at both axial ends or simply lies in channel **12**. In either case the screw is rotated by a preferably electric worm drive **16** in such a way that it acts in the direction indicated by arrow A. Channel **12** is preferably supported on a base **20** via supports **18**. A solids discharge **19** is provided at the upper end of channel **12**.

A filter tank **22**, which appears as a triangle in the longitudinal section of Fig. 1 and has a horizontally extending upper edge **24**, is mounted to channel **12**. As may be seen in Fig. 3, the cross section of the filter tank **22** tapers in downward direction and is adapted to the width of channel **12**. As indicated in Fig. 2, the filter tank **22** is preferably divided into three sections: a first section **26** with increasing width starting from the end, a middle section **28** with a larger, preferably about constant width, and a third section **30** with a width tapering again to the width of channel **12**. Due to the downward tapering (Fig. 3), the contour described here and shown in Fig. 2 of course applies—strictly speaking—only to the upper edge **24** of the filter tank **22**.

As may be seen in Fig. 1, an intake **32** for the material to be separated is provided in the upper end area of the middle section **28**.

A rotary disk filter unit **34** schematically illustrated in detail in Fig. 4 is arranged in the area of end **34** of the filter tank **22** (the free corner of the triangle). This rotary disk filter unit **34** is supported on base **20** via supports **38**.

Between the separation material intake **32** and the rotary disk filter unit **34** a deflector baffle **36** is furthermore provided near the separation material intake **32**. It is preferably L-shaped, with a first substantially perpendicular section and a second oblique to approximately horizontal section extending in the direction of

the separation material intake **32**. The deflector baffle **36** is fixed to the wall of the filter tank **22** on both sides.

Figure 4 shows a cross section of an embodiment of a rotary disk filter unit **34** which has **6** filter disk pairs **40** rather than the three shown in the embodiment of Fig. 1 to 3.

The rotary disk filter unit **34** depicted in Fig. 4 thus comprises six filter disk pairs **40** mounted coaxially one behind the other on a rotatable shaft **42**. This shaft is driven by a drive unit **44**. The individual filter disks 46 of each filter disk pair **40** comprise a support structure (not depicted) to which a disk-shaped screen is mounted through which the clarified fluid can pass. An outlet **48** for the thick stock is arranged on the side opposite the intake (Fig. 1). The filter disks **46** divide the interior of the rotary disk filter unit **34** into two areas separated from one another by the screens: the intake area **50** and the outlet area **52**, which opens out into the clear fluid outlet **54**. To this end the filter disks **46** are sealed along their outer circumference with respect to a housing **55** by means of seals **53**.

The function of the first embodiment of the fluid separating unit **10a** will now be described.

The multicomponent fluid to be separated into three fractions enters the filter tank **22** via the separation material intake **32**. The flow is directed away from the rotary disk filter unit **34** by deflector baffle **36** to force the fluid to take the path indicated by arrow B (Fig. 1). Heavy particles, particularly coarse sand, stones, metal particles, etc. (indicated with reference number **57**) migrate downwardly into channel **22** and thus into the effective area of the conveyor screw **14** by

which these components are transported upwardly in channel **12** to solids outlet **19**, through which they are discharged.

Simultaneously with the downward separation of the solids, lighter, particularly fibrous material etc. rises in upward direction toward the liquid surface level **58** and moves in the direction of the rotary disk filter unit **34**. In the intake area **50** of said unit, the fiber/liquid mixture, which continues to thicken, reaches the zone of influence of the rotating filter disks **46**, which are driven by drive unit **44** and rotate clockwise as indicated by arrow C in Fig. 1. The rotary action causes the mixture to be increasingly entrained in clockwise direction. The liquid fraction passes through the screens in axial direction of the shaft **42** into the separate drainage area **52**, as indicated by arrows D in Fig. 4. The clarified liquid finally exits through the clear fluid outlet **54** toward the outside.

Due to the increasing removal of the liquid phase, the mixture remaining between the filter disks **46** continues to thicken and is finally discharged via the thick stock outlet **48**.

The above-described fluid separating unit **10a** according to the invention ensures excellent separation of a multicomponent mixture, which occurs particularly in the paper industry, into three separate recoverable or disposable fractions. The heavy materials, such as sand, stones, larger metal particles (e.g., staples) etc. form the first heavy particle fraction. The fibrous and mineral materials together with fine sand, other smaller particles (e.g., organic particles with a lower density than water, such as expanded polystyrene) form the second thickened sludge fraction, and the filtered fluid, preferably water, forms the third clear fluid fraction. The composition between the first and the second fraction can be varied within certain limits depending on surface selection and residence time.

Figures 5a to 5c show three further developments of the invention in which a plurality of parallel, spaced-apart baffles **60** are provided inside the filter tank **22**. These baffles preferably take up the entire width of the filter tank **22**, i.e., they are mounted to the sidewalls (not depicted) on both sides of the filter tank **22**. At the top, these baffles **60** go almost up the open liquid surface level **58** within the filter tank **22** and below reach up to near the conveyor screw **14**. The baffles **60** define the path of the material to be separated. In particular, the multicomponent fluid is first guided in downward direction through a first group of baffles **60a** to the conveyor screw **14** and then, downstream from the separation material intake **32** is guided through a second group of baffles **60b** in the direction of the rotary filter unit **34**. Depending on the path to be defined for the fluid flow, the variant shown in Figure 5a, 5b or 5c is selected.

Figures 6a to **6c** depict a further development of the invention in a schematic cross section, a longitudinal section and a top view. This further development is distinguished by a gas injection unit **62**, which essentially comprises a gas inlet **64**, an approximately T-shaped supply line **66**, and three injection lines **68** protruding approximately in the shape of a W. A plurality of injection nozzles is arranged in the injection line **68** to direct a gas, preferably compressed air, into the filter tank **22** and thus to accelerate and enhance the separation process between coarse and heavy solids and fine particles. The fine gas bubbles that form attach themselves to the small particles and carry them to the liquid surface level **58**.

A second embodiment of the invention is depicted in Figures 7 and 8. This second embodiment of a fluid separating unit **10b** is identical to the first with respect to the parts carrying identical reference numbers. It is distinguished only by the fact

that it has a first embodiment of a drum filter unit **70** instead of the rotary disk filter unit **34** (Fig. 1 to 6).

This drum filter unit **70** essentially comprises a screening drum **74**, which is driven by a drum drive **72** and the lateral surface of which consists of a screen or fabric and is thus passable for fluids. Inside the screening drum **74** there is a conveyor spiral **76**, which in the embodiment shown has a pitch decreasing in conveying direction F. A collecting basin **78** that opens into a clear fluid outlet **80** for the purified fluid is provided below the screening drum **74**.

A drum cleaning unit **82** comprising a plurality of cleaning nozzles **84**, which spray a cleaning liquid onto the screening drum to clean it, is arranged above the screening drum **74**. A cleaning liquid collecting channel **86**, which collects the cleaning liquid and conveys it to the filter tank **22**, is preferably arranged in the interior of the drum.

The drum filter unit **70** is charged with precleaned fluid from the filter tank **22** via a spout **88**. The further developments depicted in Figures 5 and 6 in the form of baffles **60** and gas injection unit **62** may of course be used in this embodiment as well.

In this embodiment, the mixture previously separated from the coarse solid particles in the filter tank **22** is transported via the spout **88** into the interior of the screening drum **74**. The liquid can pass through the screen aperture and is collected in the collecting basin **78** and discharged through the clear fluid outlet **80**. The conveyor spiral **76** transports the solids in upward direction (identified by F) against the pitch of the drum axis. This causes them to thicken because additional liquid flows off.

These thickened solids then exit from the screening drum via a solids discharge **90**.

The rotating screening drum **74** is cleaned by means of the drum cleaning unit **82** as it passes at the summit. A cleaning liquid, preferably water, is sprayed onto the screening drum **74** causing the adhering particles to flow into the collecting channel **86** and to be transported back to the filter tank **22**.

Figures 8a and 8b show two cross sections along lines A–A and B–B of Figure 7. The black ring is the conveyor spiral **76** with the externally attached screening drum **74**. The two sections show that the conveyor spiral **76** preferably has a decreasing depth in conveying direction.

Figures 9a, 9b and 9c are three views or schematic sections through a third embodiment of the fluid separating unit **10c** according to the invention. This embodiment is distinguished from the other embodiments **10a** and **10b** in that the rotary filter unit is configured as a screening drum **92** that is arranged inside the filter tank **22**. In other respects, the same reference numbers identify the same components as in the previous embodiments. Although not described in detail, this embodiment can of course again be provided with the further developments described in Figures 5 and 6.

As shown in Figures 9a – c, the screening drum **92** is submerged in the filter tank **22** by about **50%** below the liquid surface level **58**. The screening drum **92** comprises a rotary axis **94**, at the one end of which a drum drive unit **96** is provided. A clear fluid discharge tube **98** is coaxially arranged at the opposite axial end. Directly adjacent to the outer circumference of the screening drum **92**, a

skimming edge **100** forming part of the thick stock discharge **102** is provided at the end of the filter tank **22**.

The mode of operation of this embodiment is identical to the embodiments described above except for the function of the screening drum **92**. In the present embodiment, the fluid separated from the solids especially passes through the permeable lateral surface **104** in the lower submerged area of the screening drum **92** (indicated by arrows) and flows into the interior of the screening drum **92** to the clear fluid discharge tube **98**. The thick stock, which especially accumulates in the area of the liquid surface level **58** cannot pass through the lateral surface **104** but is entrained in the rotary movement (counter clockwise in Figure 9b). It is stripped off by skimming edge **100** and then reaches the thick stock discharge **102**.

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32.821 MR

New Claims

1. Fluid separating apparatus for separating liquids and solids from a fibrous material containing multicomponent fluid having the following features:

a) an upwardly sloping channel (12) with a closed lower end and an outlet (19) at the upper end comprises an axially extending conveyor screw (14) arranged in the interior,

b) ~~a filter tank (22) is arranged above~~ a lower part of the channel (12) ~~and communicates therewith~~ forms a tilted floor segment of a filter tank (22) with a closed and an open end,

b1) an upper part of the channel (12) with the outlet (19) projects beyond the edge (24) of the filter tank (22) in the area of the closed tank end,

c) ~~at the upper edge approximately in the center~~ a separation material intake (32) for the multicomponent fluid to be separated is centered between the open and the closed end of the filter tank (22),

~~**characterized in that:**~~

d) a rotary filter unit (34, 70, 92), which is partially submerged in the fluid contained in the filter tank (22) is arranged at the ~~free~~ open end of the filter tank (22).

2. (unchanged)

3. (unchanged)

4. Fluid separating apparatus as claimed in Claim 1, characterized in that, along the upper edge (24), the width of the filter tank (22) as viewed in longitudinal direction increases in a first section (26), remains about constant in a middle section (28) in which the separation material intake (32) is located, and tapers to the width of the channel (12) in a third section (30).

5. (unchanged)
6. (unchanged)
7. (unchanged)
8. (unchanged)
9. (unchanged)
10. (unchanged)
11. (unchanged)

12. Fluid separating apparatus as claimed in Claim 11 ~~10~~, characterized in that the gas injection unit (62) has at least three injection lines (68) which are provided with spaced-apart injection nozzles and together with a transversely extending supply line (66) form an approximately W-shaped structure, wherein the two outer injection lines (68) are arranged parallel to the sidewalls of the filter tank (22) and the central injection line (68) is arranged axially.

13. (unchanged)
14. (unchanged)
15. (unchanged)
16. (unchanged)
17. (unchanged)
18. (unchanged)
19. (unchanged)
20. (unchanged)
21. (unchanged)

22. (unchanged)

23. (unchanged)

24. (unchanged)

25. (unchanged)

Fig. 1

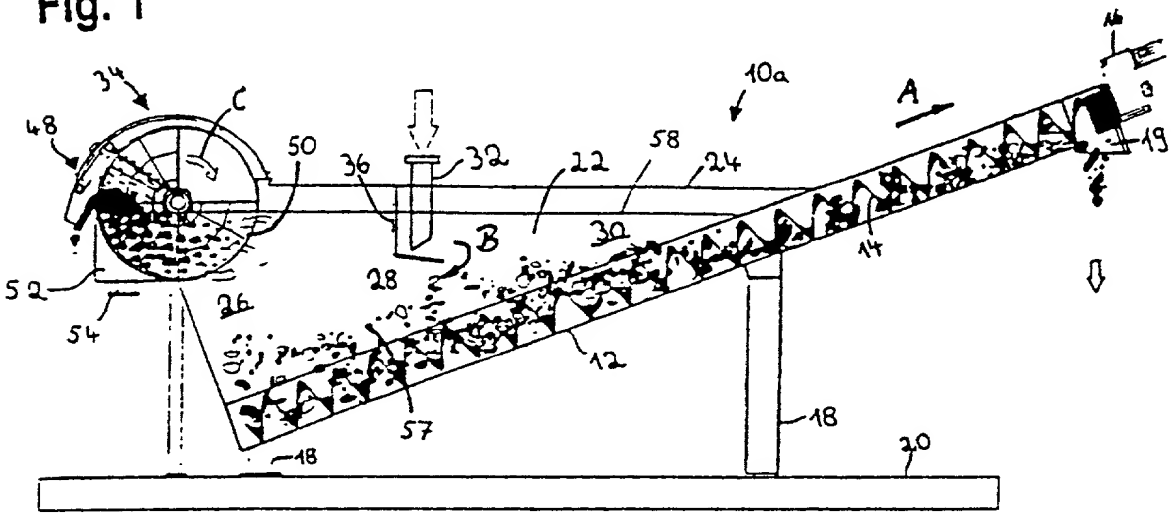

34
C
48
50
36
32
22
58
24
10a
A
19
52
54
26
28
B
30
14
12
57
18
18
20

Fig. 2

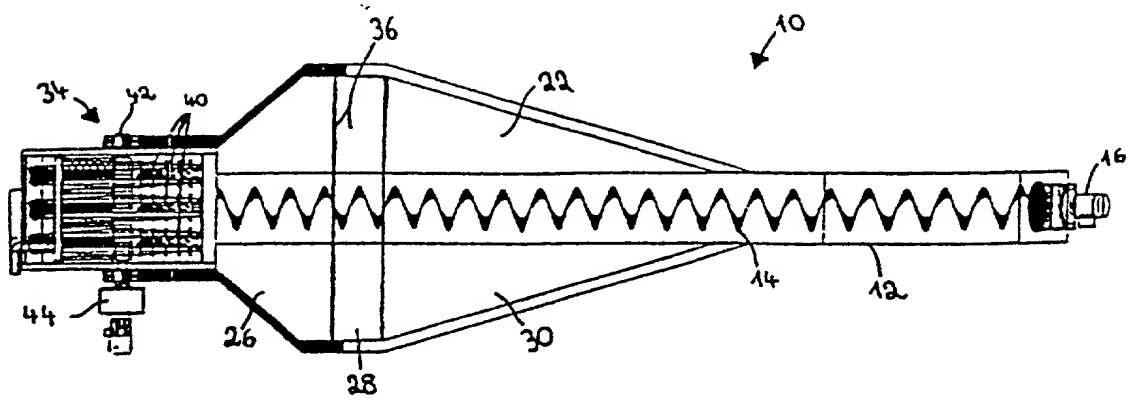

36
10
34
42
40
22
16
44
26
28
30
14
12

Fig. 3

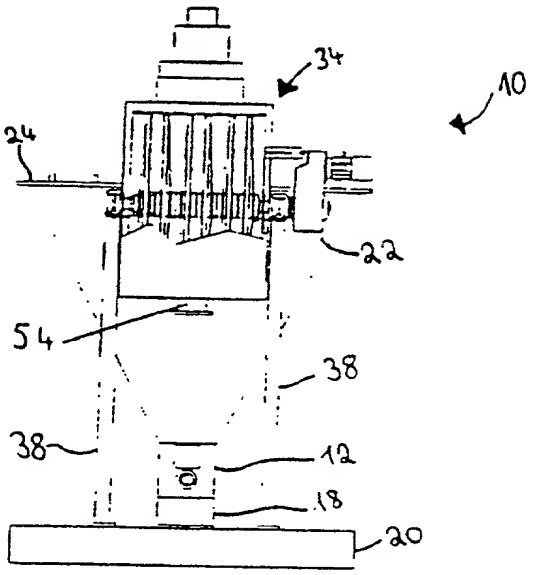
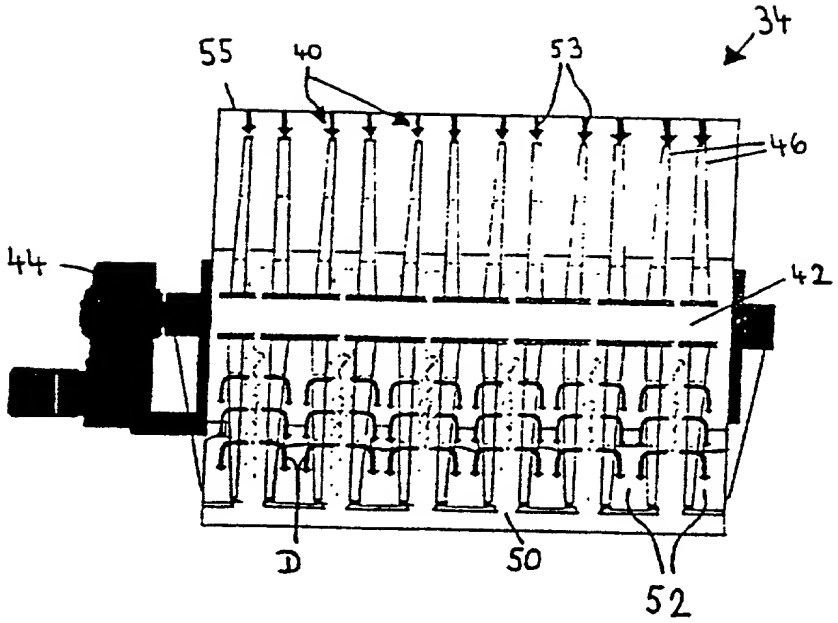


Fig. 4



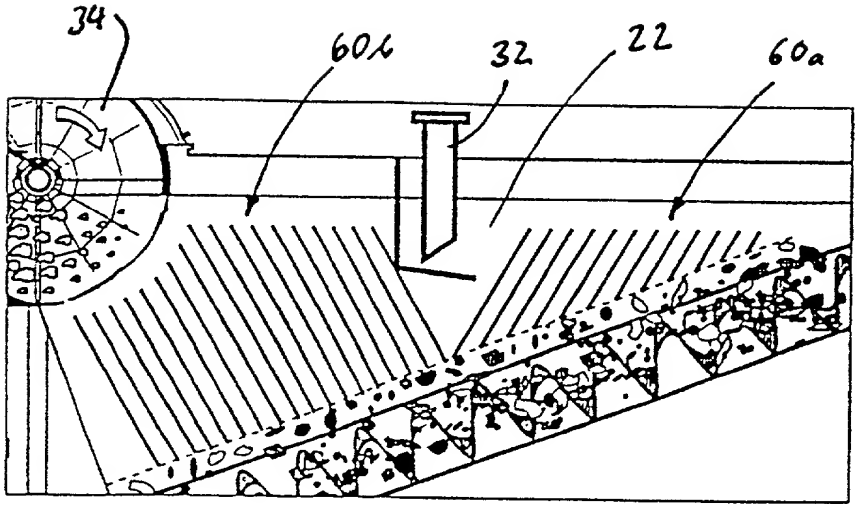


Fig. 5a

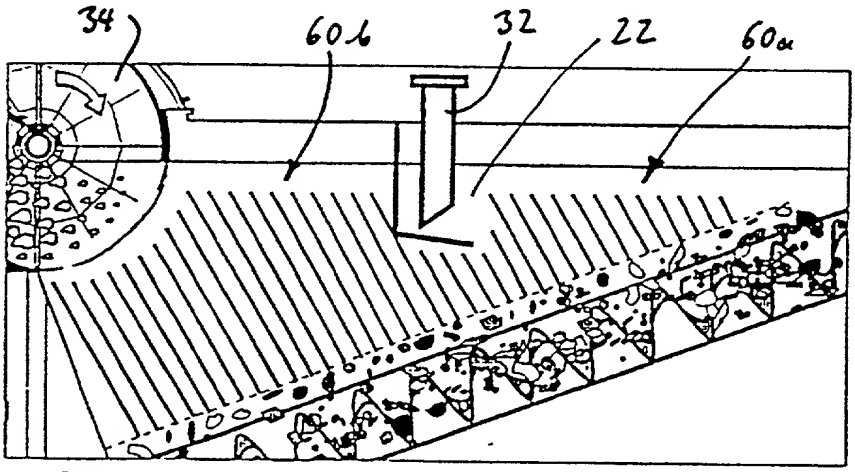


Fig. 5b

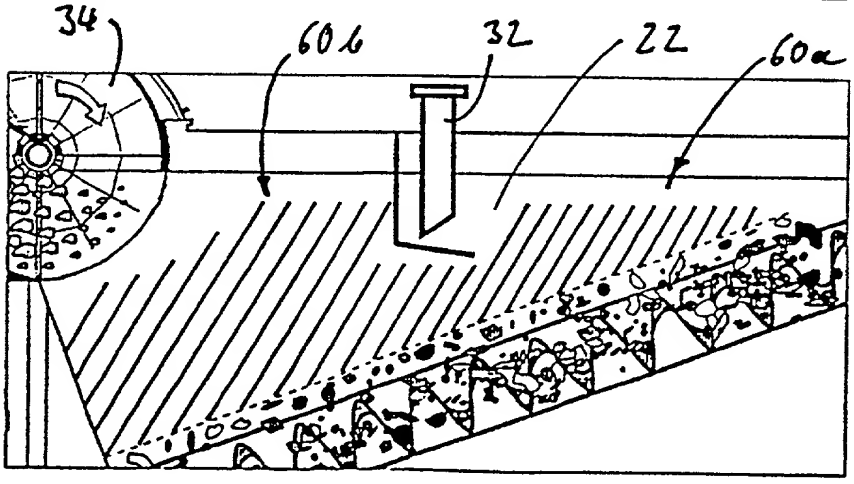


Fig. 5c

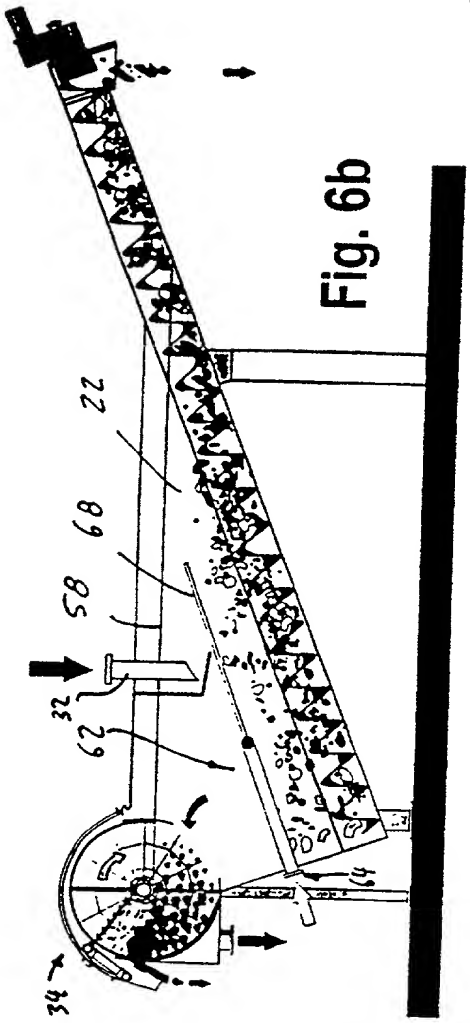


Fig. 6b

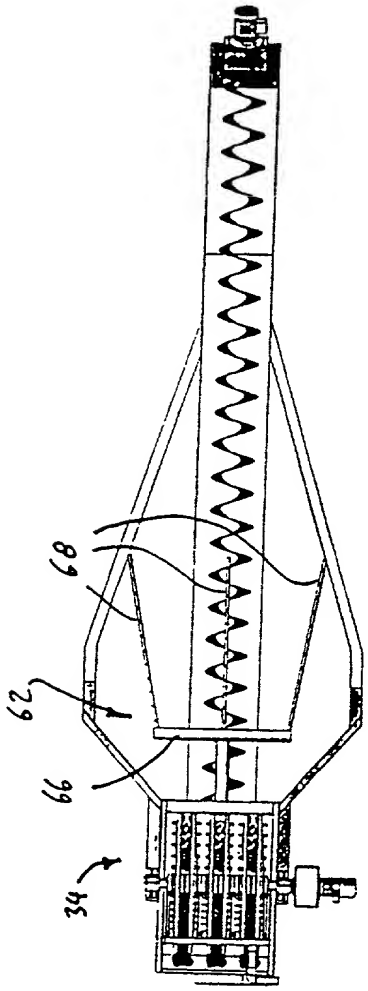


Fig. 6c

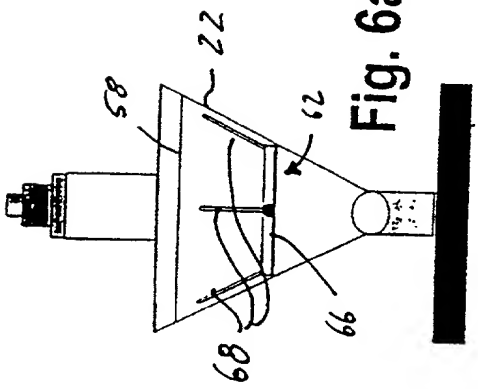


Fig. 6a

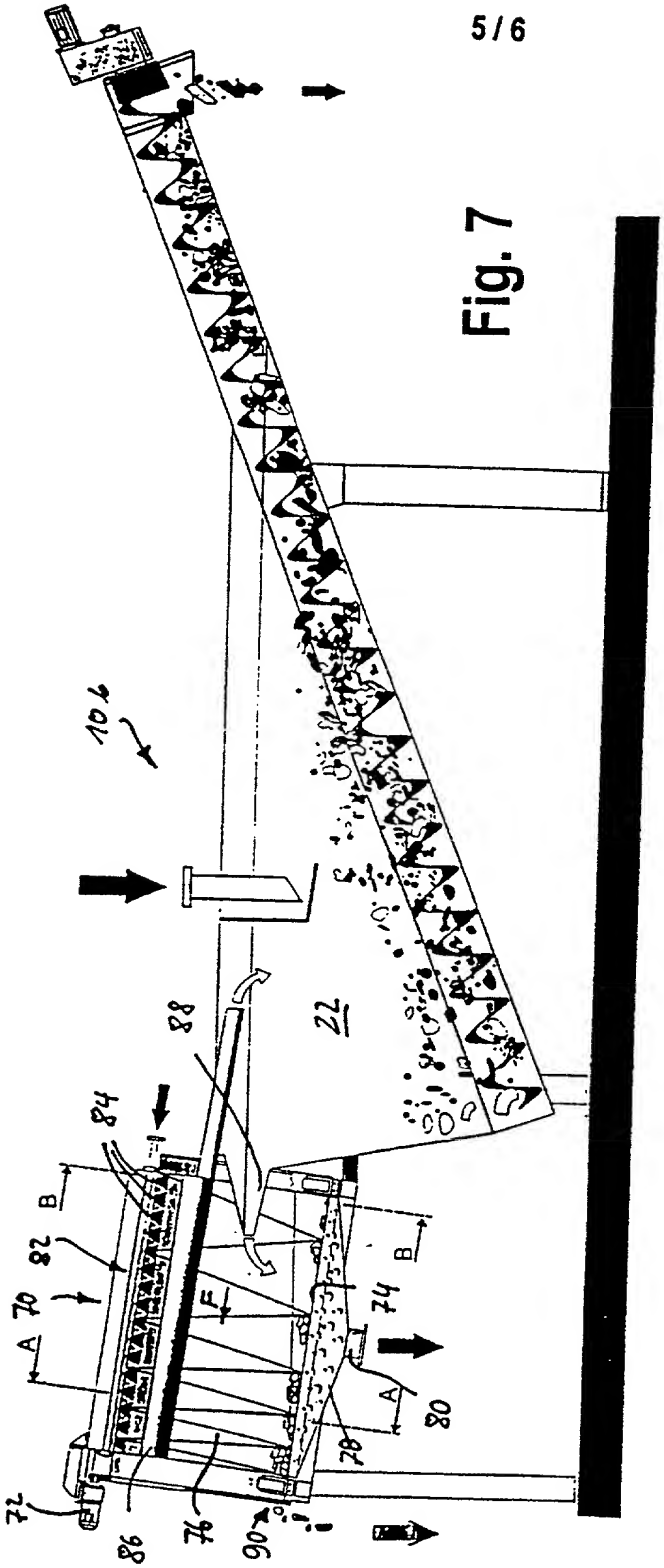


Fig. 7

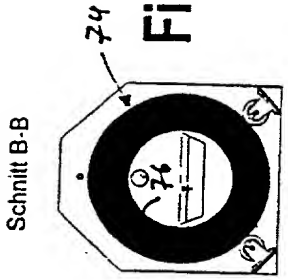


Fig. 8b

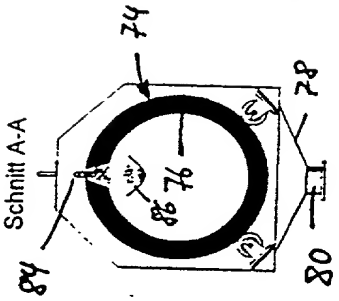


Fig. 8a

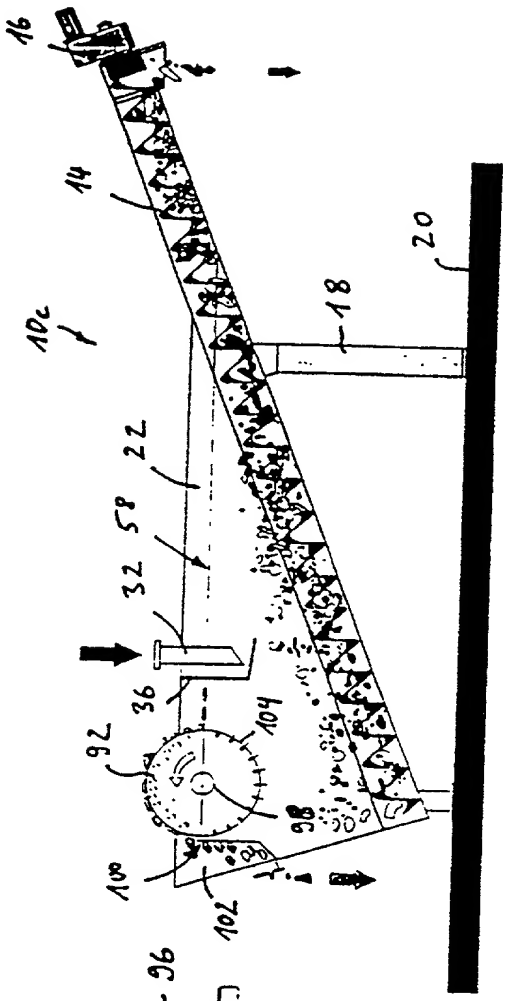


Fig. 9b

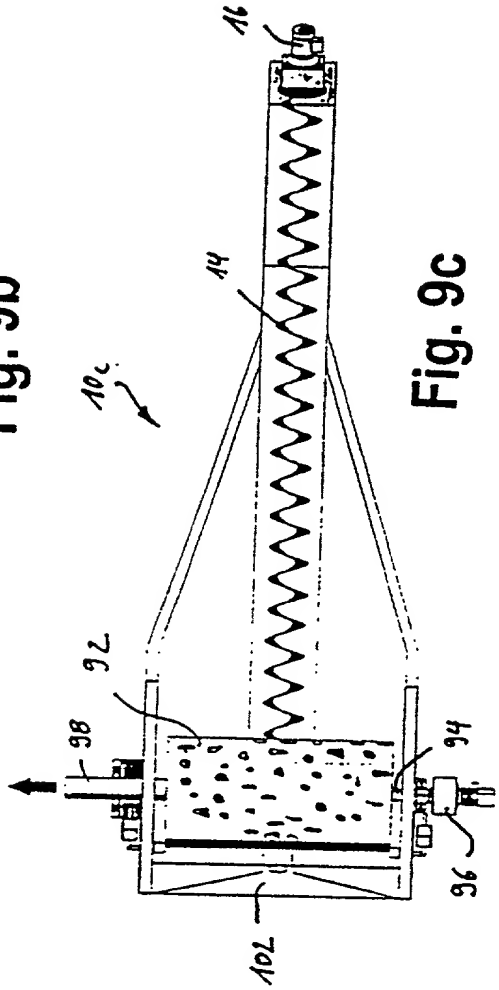


Fig. 9c

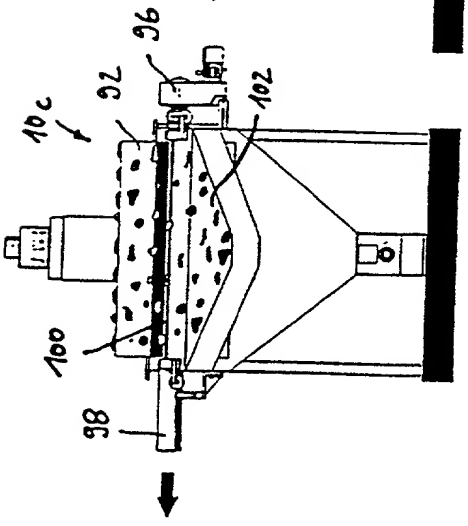


Fig. 9a

DECLARATION FOR NON-PROVISIONAL PATENT APPLICATION*

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below at 201 et seq. beneath my name.

I believe I am the original, first and sole inventor if only one name is listed at 201 below, or an original, first and joint inventor if plural names are listed at 201 et seq. below, of the subject matter which is claimed and for which a patent is sought on the invention entitled

DEVICE FOR SEPARATING FLUIDS

and for which a patent application:
☒ is attached hereto and includes amendment(s) filed on *(if applicable)*
☐ was filed in the United States on as Application No. *(for declaration not accompanying application)*
☐ with amendment(s) filed on *(if applicable)*
☒ was filed as PCT international Application No. PCT/DE00/00072 on 5 January 2000 and was amended under PCT Article 19 on *(if applicable)*

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED PRIOR TO THE FILING DATE OF THE APPLICATION			
APPLICATION NUMBER	COUNTRY	DATE OF FILING (day, month, year)	PRIORITY CLAIMED
199 00 280.0	Germany	8 January 1999	YES X NO
			YES NO
			YES NO

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

PROVISIONAL APPLICATION NUMBER	FILING DATE

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information known to me which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

NON-PROVISIONAL APPLICATION SERIAL NO.	FILING DATE	STATUS		
		PATENTED	PENDING	ABANDONED

* for use only when the application is assigned to a company, partnership or other organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon

201

FULL NAME OF INVENTOR	LAST NAME: Troubounis	FIRST NAME: George	MIDDLE NAME:
RESIDENCE & CITIZENSHIP	CITY: München	STATE OR FOREIGN COUNTRY: Germany DE X	COUNTRY OF CITIZENSHIP: Germany
POST OFFICE ADDRESS	STREET: Tal 22	CITY: München	STATE OR COUNTRY: Germany / ZIP CODE: D-80331
	SIGNATURE OF INVENTOR 201		DATE: 5.7.01

202

FULL NAME OF INVENTOR	LAST NAME: Menke	FIRST NAME: Lucas	MIDDLE NAME:
RESIDENCE & CITIZENSHIP	CITY: München	STATE OR FOREIGN COUNTRY: Germany DE X	COUNTRY OF CITIZENSHIP: Germany
POST OFFICE ADDRESS	STREET: ~~Sandstrasse 35~~ Prosperstr. 36	CITY: München	STATE OR COUNTRY: Germany / ZIP CODE: D-80335
	SIGNATURE OF INVENTOR 202		DATE: 5.7.01

203

FULL NAME OF INVENTOR	LAST NAME: Wünsche	FIRST NAME: Gisbert	MIDDLE NAME:
RESIDENCE & CITIZENSHIP	CITY: Rosental-Bielatal	STATE OR FOREIGN COUNTRY: Germany DE X	COUNTRY OF CITIZENSHIP: Germany
POST OFFICE ADDRESS	STREET: Talblick 1	CITY: Rosental-Bielatal	STATE OR COUNTRY: Germany / ZIP CODE: D-01824
	SIGNATURE OF INVENTOR 203: Gisbert Wünsche		DATE: 13.7.01

204

FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY / ZIP CODE
	SIGNATURE OF INVENTOR 204		DATE

205

FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY / ZIP CODE
	SIGNATURE OF INVENTOR 205		DATE

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DECLARATION FOR NON-PROVISIONAL PATENT APPLICATION*

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DEVICE FOR SEPARATING FLUIDS

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☒ is attached hereto and includes amendment(s) filed on *(if applicable)*
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EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED PRIOR TO THE FILING DATE OF THE APPLICATION			
APPLICATION NUMBER	COUNTRY	DATE OF FILING (day, month, year)	PRIORITY CLAIMED
19900 280.0	Germany	8 January 1999	YES X NO
			YES NO
			YES NO

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below

PROVISIONAL APPLICATION NUMBER	FILING DATE

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information known to me which is material to patentability as defined in Title 37, Code of Federal Regulations, §1 56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

NON-PROVISIONAL APPLICATION SERIAL NO.	FILING DATE	STATUS		
		PATENTED	PENDING	ABANDONED

* for use only when the application is assigned to a co[illegible], partnership or other organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

201	FULL NAME OF INVENTOR	LAST NAME: Troubounis	FIRST NAME: George	MIDDLE NAME:	
	RESIDENCE & CITIZENSHIP	CITY: München	STATE OR FOREIGN COUNTRY: Germany	COUNTRY OF CITIZENSHIP: Germany	
	POST OFFICE ADDRESS	STREET: Tal 22	CITY: München	STATE OR COUNTRY: Germany	ZIP CODE: D-80331
		SIGNATURE OF INVENTOR 201		DATE: 5.7.01	
202	FULL NAME OF INVENTOR	LAST NAME: Menke	FIRST NAME: Lucas	MIDDLE NAME:	
	RESIDENCE & CITIZENSHIP	CITY: München	STATE OR FOREIGN COUNTRY: Germany	COUNTRY OF CITIZENSHIP: Germany	
	POST OFFICE ADDRESS	STREET: ~~Sandstrasse 35~~ Praschleex-Str. 36	CITY: ~~München~~	STATE OR COUNTRY: Germany	ZIP CODE: D-80335
		SIGNATURE OF INVENTOR 202		DATE: 5.7.01	
203	FULL NAME OF INVENTOR	LAST NAME: Wünsche	FIRST NAME: Gisbert	MIDDLE NAME:	
	RESIDENCE & CITIZENSHIP	CITY: Rosental-Bielatal	STATE OR FOREIGN COUNTRY: Germany	COUNTRY OF CITIZENSHIP: Germany	
	POST OFFICE ADDRESS	STREET: Talblick 1	CITY: Rosental-Bielatal	STATE OR COUNTRY: Germany	ZIP CODE: D-01824
		SIGNATURE OF INVENTOR 203		DATE:	
204	FULL NAME OF INVENTOR	LAST NAME:	FIRST NAME:	MIDDLE NAME:	
	RESIDENCE & CITIZENSHIP	CITY:	STATE OR FOREIGN COUNTRY:	COUNTRY OF CITIZENSHIP:	
	POST OFFICE ADDRESS	STREET:	CITY:	STATE OR COUNTRY:	ZIP CODE:
		SIGNATURE OF INVENTOR 204		DATE:	
205	FULL NAME OF INVENTOR	LAST NAME:	FIRST NAME:	MIDDLE NAME:	
	RESIDENCE & CITIZENSHIP	CITY:	STATE OR FOREIGN COUNTRY:	COUNTRY OF CITIZENSHIP:	
	POST OFFICE ADDRESS	STREET:	CITY:	STATE OR COUNTRY:	ZIP CODE:
		SIGNATURE OF INVENTOR 205		DATE:	